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Name of Examination : **Summer 2021** - (Preview)

Course Code & Course Name : **ME254U - Machine Drawing and Computer Graphics**

Generated At : **19-04-2022 15:05:00**

Maximum Marks : **60**   Duration : **3 Hrs**

[Edit] [Print] [View Answer Key] [Close] **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. All questions are compulsory.

2. Illustrate your answer with suitable figures/sketches wherever necessary.

3. Assume suitable additional data; if required.

4. Use of logarithmic table, drawing instruments and non-programmable calculators are allowing.

5. Furnishing and fill self-information as ask on answer-sheet by blue ink pen only. But all sketches and regarding short description should being write and drawn   by black H or 2H or HB Pencils on Answering the questions.

6. Figures to the right indicate full marks.

1)   **Attempt any <u>Two</u> from following Sub-questions.**

   a) **A vertical cylinder of φ 50 mm and height 80 mm, resting on its base in H.P. is completely penetrated by another cylinder of the same dimensions. The axes of the two cylinders bisect each other at right angle. Draw their projections showing lines of intersections by first angle orthographic projection method.** [6]

   b) **Draw the front and RH Side view of 12 mm nominal diameter of Hexagonal headed Bolt with Nut and washer by using first angle orthographic projection method. For that use standard mathematical relations (write by dark pencil on answering) and also shows over the diagrams along with dimensions obtained from it.** [6]

   c) **Draw the conventions used for representation of the following machine components** [6]
     1. Bearings, 2. External screw threads 3. semi- elliptical leaf spring with eye,
     (use proportionate scale for all).

2)   **Attempt any <u>Two</u> from following Sub-questions.**

   a) **Draw the following types of nuts and labelling its empirical relations by considering Nut nominal diameter M16 X 2. Use all mathematical relations for calculating all dimensions and also state it over the each type of sketch.** [6]
     1. Flanged nut
     2. Cap nut
     3. Dome nut
     4. Capstan nut
     5. Ring nut
     6. Wing nut.
     Sketch all by true scale.

   b) **Fig. No. 2.b. shows a component that is to be fabricated by welding different components marked as 1, 2, ... 5. Draw its orthographic views with welding symbol by first angle orthographic Projection method. Joints for tapered plates 3, 4, and 5 are to be made using fillet welds of throat size 6 mm. Parts 1 and 2 are to be welded all around by a single V groove of depth 5 mm with convex surface.** [6]
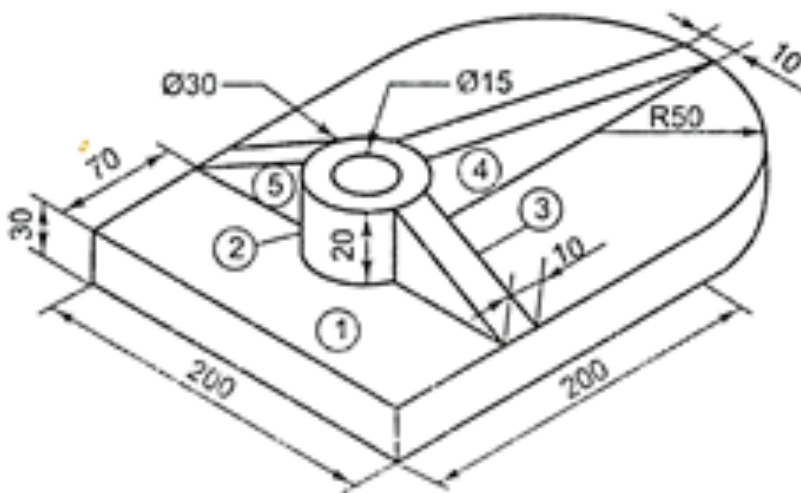

Fig. No. 2.b

   c) **A right circular cylinder of φ 60 mm and height 90 mm, resting on its base in HP. It is completely penetrated by another cylinder of φ 45 mm and 90 mm long, such that their axes bisect each other at right angles and are parallel to VP. Draw their Projections showing curve of intersection by methods of line.** [6]

3)   **Attempt any <u>Two</u> from following Sub-questions.**

a) **A forked support with 20 mm thick forks shown in fig no. 3.a. has two holes 30 mm below top surface such that their concentricity is within 0.2 mm and position is within 0.05 mm both in X and Y directions. The axis should be parallel to top surface within 0.1 mm. Show all above by the geometrical tolerances on given fig.3.a** [6]
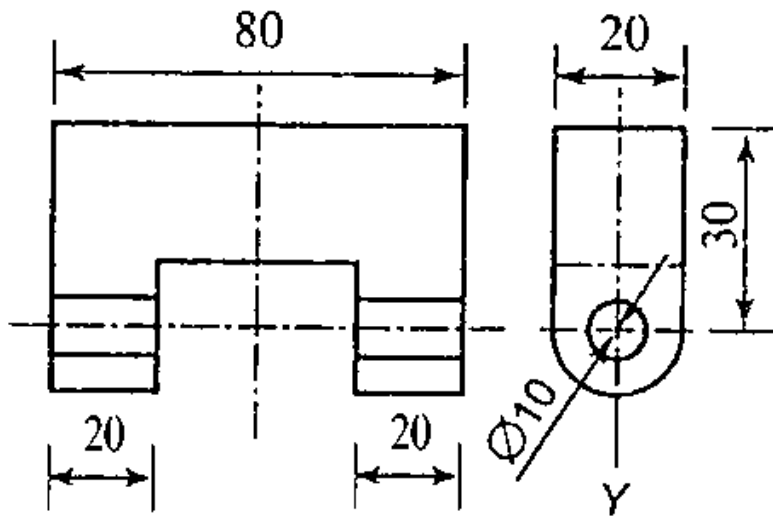

Fig. No. 3.a

b) **Draw following piping symbols (double line) by proportionate scale only (No conventional diagrams are required)** [6]
  i)   Lateral joint
  ii)   Safety valve
  iii) Elbow Up
  iv) Solenoid valve (two way)
  v) Control valve
  vi) Orifice.

c) **(i) Draw & Show the welding symbols incorporated with following parameter on the component   - field weld,** [6]
    - reference and leader line,
    - all round,
    -length of weld,
    - arrow side and other side,
  (ii) Draw the various conventions and symbols represented for following welding joints such as,
    -fillet weld,
    -square butt weld,
    -single V- butt weld,
    -single bevel butt weld,
     (draw all above proportionately)

4)   **Attempt All from following Sub-questions.**

a) **Calculate the all dimensions of following Rivet joint by using standard mathematical relations (empirical formulas). Also draw and showing over the sectional front view and top view of Double riveted butt joint of plates having thickness 09 mm with double straps chain type riveting. (steps of calculation shall be write by dark pencil only).** [12]

5)   **Attempt All from following Sub-questions.**

a) **Details of Power screw jack are shown in fig. no. 5.a. Complete the assembled view of all parts in respect of i) top view and ii) Full sectional front view along A-A and iii) L.H. S. V. and also including the BoM. (Use first angle orthographic projection method and use reduction scale, if required).**　　[12]
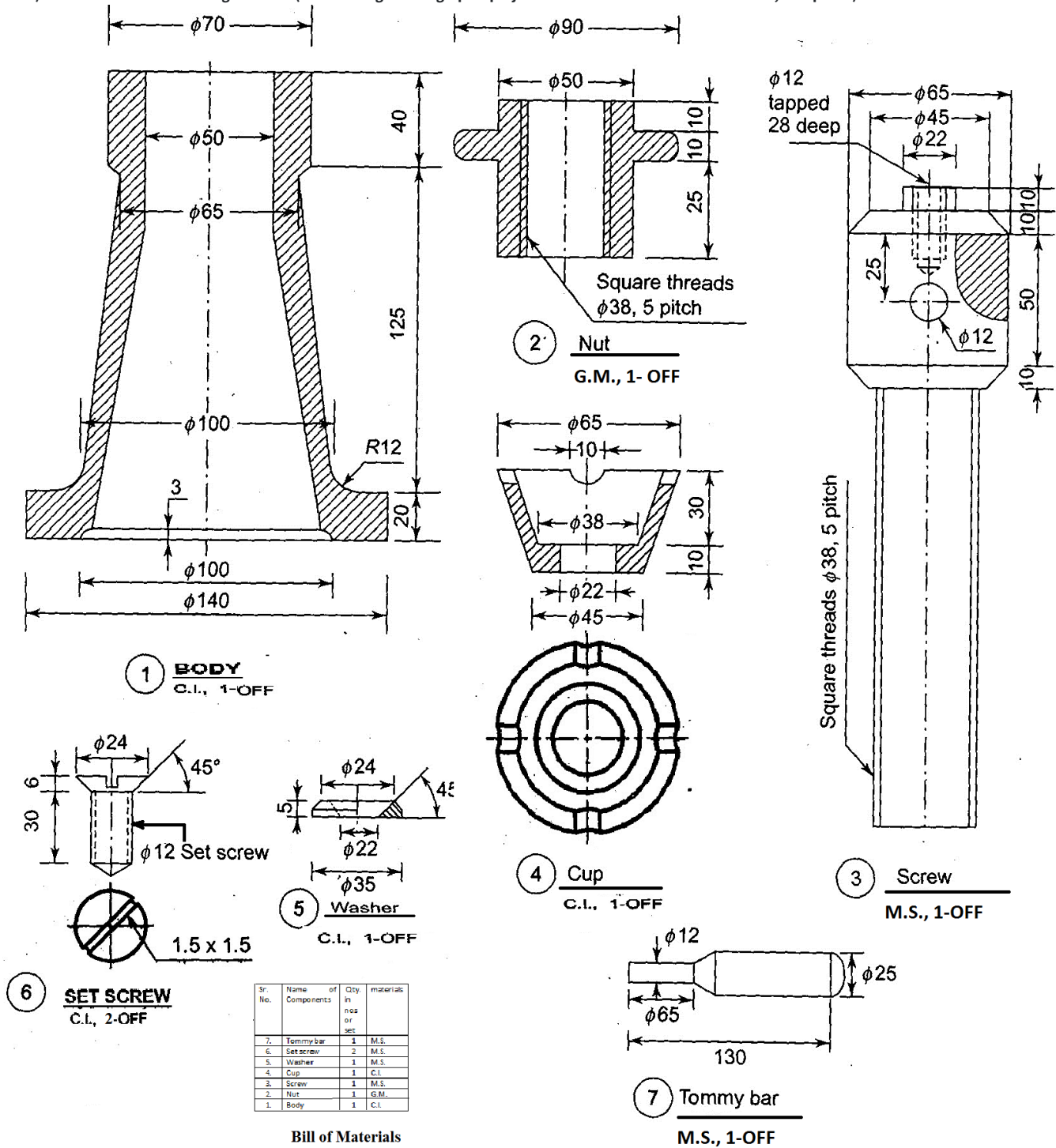

Fig. No. 5.a. Details of Power Screw Jack

Bill of Materials

Sr. No.	Name of Components	Qty. in nos or set	materials
7.	Tommy bar	1	M.S.
6.	Set screw	2	M.S.
5.	Washer	1	M.S.
4.	Cup	1	C.I.
3.	Screw	1	M.S.
2.	Nut	1	G.M.
1.	Body	1	C.I.